A Mediated Approach to the Virtual Learning Environment (VLE): Implications for Academic Libraries in the 21st Century

Robert Akinade Awoyemi, Adeyemi Federal College of Education, Adeyemi, Nigeria

Richard Oluwadolapo Awoyemi, Adeyemi Federal College of Education, Adeyemi, Nigeria

ABSTRACT

This paper examines the virtual learning environment (VLE) in relation to its implication for academic libraries in the 21st century. It sheds light on how technological development has had major impacts in the academic library, with regards to how information is being constructed, transmitted, and accessed by library users. In the course of this discourse, it was deduced that students constitute a significant percentage of the academic library users. The technological development in the academic sphere has enabled ubiquitous interactions between students and teachers, in which students are enabled to learn and communicate with their teachers from remote locations, thus inducing the notion of VLE. The VLE is regarded as a technologically based environment where learners are enabled to access learning outside the classroom. With the aid of VLE, students are granted ownership of their learning process, thus ensuring positive learning outcomes. Finally, the technology acceptance model (TAM) was employed to serve as the theoretical basis of this discourse.

KEYWORDS

Academic Library, Librarians, Students, Virtual Learning Environment (VLE)

INTRODUCTION

The development in terms of information communication technologies (ICTs) in the 21st century has drastically remodified how people find, approach and access information, thus changing how individuals communicate in their daily life activities (Huang, Shu, Yeh and Zeng, 2016). Lessick and Kraft (2017) posit that the massive technological development over the years has had major impacts in the academic library, with regards to how information is being constructed, communicated and accessed by users. Ibrahim, Daghestani and Alqahtani. (2017) maintain that due to the rapid evolving nature of ICTs, the procedures entailed in construction, storage, retrieval and dissemination of knowledge is being transformed on a daily basis in the academic library. Over the course of time ICTs have been equipped successfully in several field of life, most especially in the academic sphere, for delivering instruction to a widespread student population. The application of ICTs in the academic sphere has enabled ubiquitous interaction between students and teachers, in which students are enabled to communicate with their teachers online without being constrained by their geographical location,

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thus bringing about the notion of Virtual Learning Environment (VLE). According to Santos and Esposo-Betan (2017), the VLE has emerged to become one of the most important technological feature of the 21st century with regards to its various application, usage and ability to provide an effective teaching paradigm. The recent increase in the use of the VLE can be traced to the development of mobile technologies (smartphones and tablets) which went mainstreamed in 2010. Akçayır and Akçayır (2017) state that, with the emergence of various new technologies in the contemporary society, it is pertinent for librarians to acquaint themselves with the technological sphere in order to become more efficient in their service delivery. VLE offers a medium through which librarians are enabled to get well involved with library users and understand their immediate information needs through rapid online interaction. Singh and Devi (2018) explain that VLE is not simply a technology but a channel through which librarians are enabled with the ability to disseminate information and guide library users in their research quest. Since the academic library is regarded as a repository of knowledge, VLE will serve a significant purpose of underpinning learning and acquisition of knowledge, to provide more solid basis for education and enhance remote access to variety of research materials. Academic libraries are required to adopt VLE so as to remain effective repositories of knowledge in the 21st century, thus providing a means of rapid interaction between librarians and users.

LITERATURE REVIEW

While this paper focuses on the technological transformation of academic libraries with regards to VLE in the 21st, there is a need to review past literatures on the adoption and use of new technologies. Therefore, the Technology Acceptance Model (TAM) will serve as a theoretical basis for this paper.

Technology Acceptance Model (TAM)

In the contemporary society, several academic libraries around the world are being compelled to improve their operations and services by adopting the use of VLE. Various numbers of policies, trainings and technology adoption programs are constantly directed towards the acceptance of a technological innovation such as VLE. However, the adoption and use of VLE still remains a major challenge in the academic library. Thus, bringing about the notion of Technology Acceptance Model (TAM).

The Technology Acceptance Model (TAM) was originally proposed by Fred Davis in 1986 as a doctoral thesis at the Massachusetts Institute of Technology (MIT). Ever since TAM was proposed in 1986 it has been refined in order to incorporate variables and relationships obtained from the Fishbein and Ajzen theory of reasoned action (TRA) of 1975. The output from the adjustments was a more refined model essential for anyone willing to interrogate the theory around technology acceptance and its utilization in learning. The theoretical basis of TAM is built on the premise that when users are presented with a new technology, three major factors influence their decision on how and when they use it. The first determinant is its perceived usefulness (PU), the second is the perceived ease of use (PEU), while the third determinant is user attitude towards usage (ATU).

In 1989, Davis used TAM to explain computer usage behavior. The goal of Davis' (1989) TAM is to explain the general determinants of computer acceptance that lead to explaining users' behavior across a broad range of end-user computing technologies and user populations. The belief of a person towards a system may be influenced by other factors referred to as external variables in TAM. However, in 1996 a final version of TAM was developed by Venkatesh and Davis, after the main finding that, both perceived usefulness (PU) and perceived ease of use (PEU) had a direct influence on behavior intention, thus eliminating the need for the attitude construct (Lai, 2017).

The persistent growth of TAM-based research has majorly risen due to the proliferation and diffusion of new technological innovations, such as enterprise systems, collaboration technology in knowledge-intensive firms, mobile Internet for consumers, agile artificial intelligence and e-commerce for citizens in society. Correspondingly, VLE has penetrated certain aspects of the society and various

individuals in various disciplines are starting to acknowledge its pertinence in their daily operations. Hence, the academic library is required to shift their priorities towards adopting and making use of VLE in order to better serves their users and the society at large.

THE ACADEMIC LIBRARY

The academic library is regarded as a library that is attached to an academic institution, serving the teaching and research needs of students and staff. The academic library serves two complementary purposes; to support the school curriculum, and to support the research of the university faculty and students (Umoh, 2017). The support of teaching requires information resources for class readings and for students. Conventionally, the information resources for class readings and studies are solely prescribed and provided by teachers and class instructors. However, the academic library provides an avenue for students to go in search of more educative information resources. Academic libraries are repositories of organized collections of educative information resources (print and non-print) which form an integral part of tertiary institution. In essence, academic libraries provide resources to support the teaching and research activities of their parent institution.

In the 21st century, academic libraries are being transformed drastically. The emergence of ICT has had major effects on the academic library environment, in which scholarly records and information materials are being transformed from print-based to digital formats on the open web and various databases. The range of digital media, online applications and software that are available via ICTs are remarkable. Library users are now enabled to have access to ready-made online data sets, specialized scholarly social networking sites, data visualization software, and other series of intermediary software that are capable of expediting their research processes. These technological trends in the academic library has drastically transformed the academic library's operations into a virtual environment where library users are enabled to easily share and receive various information materials from their colleagues from any part of the world.

According to Lund and Wang (2019), the virtual environment allows the sharing of a full range of information materials and resources that are associated with the process of research (e.g., formal publications, data, methodologies and protocols, software that encapsulates methods and analysis, and even results of "failed" experiments). Such sharing would further facilitate global scholarship, accelerate discovery and accumulation of new knowledge, and provide unprecedented worldwide access to research. Additionally, these developments will enable the creation of a significant advantage around infrastructure construction, digital preservation and the academic libraries' ability to acquire more prestige within its parent institution and its immediate community.

THE VIRTUAL LEARNING ENVIRONMENT (VLE)

Information has become an essential tool for competitive advantage at the individual, organizational, societal and most especially the educational level. Over the years, VLE has become an important source of information in the education sector because information is readily required in the process of learning. The emergence of VLE has revolutionized the process of information transmission. Sharing and interchanging of information such as knowledge, mental skills, motor skills and attitudes have been made easier through the use of VLE. Considerably, achieving success in the sharing and interchanging of information with the aid of VLE has transformed the academic environment with the perception and behavior of students. Knowledge, education and learning are strongly linked with the society and its evolution. Therefore, one cannot teach or learn in the modern society the same way as a century ago. The integration of VLE in the educational system has the capability of accelerating the speed at which knowledge is acquired, in which knowledge acquisition will no more be restricted to the tradition approach.

According to Nagel (2016), VLE is a software application, typically supported by Web-based technologies which is used to plan, execute and evaluate a specific learning process. Makewa, Magaletta and Role (2017) defined VLE as an information technology based environment in which learners interact with learning materials (example assignments and exercises) and instructions are mediated through technology. Singh and Devi (2018) assert that, VLE is a term that involves online learning services, which could also be regarded as a learning platform that organizes and provides access to online learning services for students, teachers and librarians. These services include access control, provision of learning content, e-learning tools and administration of user groups.

Bahera (2019) purport that the VLE which is also known as a learning platform simulates a virtual classroom by simultaneously mixing several communication technologies. The web conferencing software which is a feature of VLE enables students and librarians to communicate with each other via webcam, microphone and real-time chatting in an online setting. With the use of web conferencing software students are enabled to raise their hands to answer questions, they are also capable of using a whiteboard and screencast when given permission by the librarian. The VLE also provides an opportunity for students to receive direct instruction from librarians in an interactive environment, such that students can have immediate access to librarians for enquires and instant feedback.

Lund and Agbaji (2018) posit that the VLE provides a structured schedule of operation which can be helpful for students who are overwhelmed by visiting the actual library. In addition, the VLE provides a social learning environment, where students who have similar interest are enabled to link up and share their knowledge. Most VLE applications provide a recording feature, in which classes can be recorded and stored on the server, thus allowing instant playback of any class over the course of the school year. This can be extremely useful for students to retrieve missed material or review concepts for an upcoming exam. Parents and guardians are also enabled with conceptual ability to monitor any classroom to ensure that they are satisfied with the education the learner is receiving.

Models of Virtual Learning Environment (VLE)

The interactive use of VLE aims at supporting student's active and exploratory learning during class. The use of VLE is comprised of diverse connection in conjunction with specialized software tools which are capable of enhancing interactions, sharing of ideas, brainstorming, collaboration and performing of various tasks. However, these features of VLE can be classified into three different models:

- Broadcast VLE Model
- Online VLE Model
- Collaborative VLE model

Broadcast VLE Model

The broadcast VLE model is similar to a classroom environment, however the instructor and students are located at two or more geographical remote locations, in which sound, full-motion video, and presentation material are transmitted from a central location (classroom or library) to remote locations. Popular examples of the broadcast VLE model includes courses and instructions delivered through videoconferencing, cable or satellite transmission (e.g. instructional projectors). In this VLE model, the instructor is viewed as the main source of knowledge, controlling content and rate of information dissemination to students. The broadcast VLE model allows both synchronous and asynchronous interaction between the instructor and the student, which implies that the instructor is enabled to interact with students in a simultaneous manner and, the instructor is also enabled to leave messages to be read by students at their convenient time.

Online VLE Model

The Online VLE model is usually based on social media (WhatsApp, Facebook, Twitter etc.). In the Online VLE model students are enabled to gain access to course content and learning resources such as simulations, computer-based exercises, demonstrations and hypertext based study guides. The instructor endows the student with the ability to select time, pace frequency and form of learning activities. This model of VLE enables students to thrive more in their learning because, interactive multimedia learning resources such as, videos, audio-notes, pictures, animation etc. are usually made available by the instructor. Unlike the broadcast VLE model, where students are labelled as receivers of information, the online VLE model facilitates proactivity of students by enabling them to manipulate, filter and construct information contents, thus increasing their cognitive abilities.

Collaborative VLE Model

The collaborative VLE model is quite similar to the online VLE model, however, the only difference is the absence of instructors. The collaborative VLE model allows students to create and share knowledge with their colleagues and individuals with the same area of interest through social media interactions across time and geographical distance. In the collaborative VLE model learning occurs from the possibility of each group members to be exposed to other group members' intelligence, opinions and beliefs, while also obtaining and providing tangible response for comprehension of other group members.

Students as Catalysts for Virtual Learning Environment (VLE)

Students constitute a significant percentage of the academic library, and their primary means of acquiring knowledge is through the process of learning and research within the academic library. Before any sort of academic qualification is ascribed to a student, he/she must have engaged in quite a number of research activities and must have thrived in them. Oyewole and Oladepo (2017) posit that in order for the academic to facilitate the information needs of students, the academic library is required to be well equipped with modern day technological innovations, thus providing students with myriad of information resources in print, audio-visual, electronic and other formats in support of teaching, learning and research.

The integration of modern day technological innovations in the academic library has the propensity of promoting various types of academic collaborations for students via wireless connections to the internet. The adoption of a cutting-edge technological innovation such as the VLE will prove to be very relevant by enabling students with the ability to expand their scope of learning beyond the classroom. Likewise, students will be motivated to be more engaged in research that will further promote their ability to learn by tapping into the wealth of knowledge scattered aboard on the web. This indicates the dynamic support that the VLE has to offer to students' learning and research practices. Gholami, Abdekhoda and Gavgani. (2018), maintain that, the VLE has massively transformed the approach to learning and research processes, thus having a positive effect on students;

- Learner Centric: The VLE explores the best in each student.
- Learning Centric: Students learn by designing and preparing meaningful research experience with the aid of the VLE.
- Collaborative Development: With the aid of the VLE students are endowed with the capability of interacting and researching collaboratively.
- Promoting Inquisitiveness: The VLE further develops the questioning ability in students.

Furthermore, Tudor, Minocha, Collins and Tilling. (2018) posit that the students' need for information is infinite, reason being that, information is always required to complete numerous set of scholarly/academic work. Information is required for completion of projects, writing of exams,

assignment completion, continuous assessment preparation, etc. In order for students to bridge the gap of their information needs they are often required to consult the academic library. More so, it is quite possible for students to have personal information needs which relates to their individual development which could also be bridged by consulting the academic library. Thus, implying that students are extensive users of the academic library.

Therefore, the academic library can better serve students by embracing the growing capabilities of VLE. The VLE has the ability to promote and expand the academic libraries' existing services by offering remote access to students and online public access catalogues: by enabling 'on the go' mobile reference services and by providing mobile access to e books, journals, video, audio books, and multimedia content to further promote the academic success of students. Thus, audio/video collections would no longer be based on physical units to borrow, but would be massively streamed and downloaded by students. More so, VLE is capable of providing more avenues for students to further demonstrate their intellectual abilities beyond the classroom, by participating in online brainstorming trivia and uploading their scores. Thus, the integration of VLE in academic libraries will transform students to become more productive in terms of data, information, media and knowledge.

IMPLICATIONS OF VIRTUAL LEARNING ENVIRONMENT (VLE) FOR ACADEMIC LIBRARIES

Academic libraries around the world have been massively influenced by the emergence of VLE in the 21st century. Oyelude (2018) asserts that the adoption of VLE in the academic library has enabled interactions via various forms of online and web platforms, in which librarians are enabled to engage library users in productive interactive sessions from any geographical location. It has been surmised that the influence of VLE in the academic library has the capability of introducing new set of developments that are likely to enhance the standard of teaching and learning in the educational sphere. These set of developments are usually in terms of a wide range of form such as, advanced mode of teaching, unrestricted access to information, sharing of multimedia contents and digital based assessment. Examples of these set of development include:

- Massive Open Online Courses (MOOCs)
- Web 2.0 Tools

Massive Open Online Courses (MOOCs)

One of the emerging innovations in the adoption of VLE in the academic library is massive open online courses (MOOCs). MOOCs are courses which make use of digital technologies, such as laptops, smartphones and tablets to provide a virtual classroom that accommodates an unlimited number of students, all simultaneously taking a course via online modality, and pay little or nothing for the course and may earn no traditional formal credit. Although these courses offer no formal credit, in theory they can enhance enrolment in formal university programs. In essence, students may find the contents of MOOCs so engaging that they are intrigued to enroll in a formal learning environment.

According to Kumar (2018), a good example of MOOCs is 'Coursera', which is one of the most widely known MOOC platform, it has more than 1.9 million registered users and there are more than 348 courses available. In contrast to the traditional courses of distance learning, the MOOCs guarantee free access to people who have Internet and "there is no criteria for the selection of students, except when it is indicated that there is need for specific prior knowledge about a particular subject matter. Based on this broad scope, the MOOCs are entitled massive, reaching a large number of people. In the MOOCs environments, learning is characterized by interaction with microstructures (micro-content, micro-lectures and micro-formats).

In addition to traditional teaching materials such as videos, readings and problem sets, MOOCs have helped to build a community for students and faculty forums. Considerably, other examples MOOCs platform include: Academic Room, EDX, Erasmus EU's and WiredAcademic. Although there are several dimensions to these examples of MOOCs, they always have three points in common:

- Free: anyone can sign up for free;
- Scale: it supports a large number of participants (large scale courses);
- Simplicity: the interface is always experiential and easy to operate.

MOOCs bind strongly to digital technologies and this is particularly by the use of VLE which is used as a form of mediation to promote the process of teaching and learning. MOOCs are considered as an integral aspect of VLE because they serve as a collective platform that favors the interactions of the users and aid in establishment of relationships for the users who use interaction tools, focusing mainly on learning. More so, MOOCs serve as an innovative technological infrastructure that is composed of several graphical interface and provides a set of tools and features for the implementation of training actions at a distance, some of these features are highlighted below:

- Management of entries, trainees and training workshops.
- Provision of areas of downloadable content.
- Making of report, including through e-mail, discussion forums, chats, audio and video conferencing.
- Registration progress and assessment of trainees.
- Management of the study activities of the trainees.

Web 2.0 Tools

Web 2.0. tools are a set of technological features that emphasize user-generated content (UGC), ease of use, participatory culture and compatibility with other systems and devices. Shonhe and Jain purport that web 2.0 tools are a set of information technologies and ideologies that enable and drive media rich content creation on the internet. Web 2.0 is rooted is well rooted in VLE because it allows users to collaborate freely using free tools and sharing their work and information with each other. The UGC proves to be a substantial aspect of web 2.0 tools and it implies, the ability to create and share content free of censorship. Web 2.0 tools are popularly referred to as social media.

According to Sibanda and Madziwa (2018), social media are web-based applications that provide functionality for sharing, relationships, group, conversation and profiles. social media are enabled with the ability to widely spread posted content. These contents are capable of spreading from person to person in a matter of seconds. Social media as a web 2.0 tool enables collaborative education, in which students are enabled to log on to their social media accounts and interact with their teachers. Social media further facilitates the VLE by providing a platform where librarians and library users are enabled to communicate freely and engage in the process of information dissemination. Thus, social media serve as an avenue for academic libraries to create a VLE where users can easily make use of information contents and get feedbacks from inquires made to librarians.

Examples of Web 2.0 Tools

Awoyemi, Akinlubi and Awoyemi (2020), provided some examples of popular web 2.0 tools that can be utilized by academic libraries in the quest of creating a VLE and further enhance their academic services in terms of staying connected with their various users. These examples are further discussed below:

Facebook

Facebook is one of the most popular web 2.0 tool in the world boasting around 1.44 billion active users in the first quarter of 2015. For most people, Facebook is not just a social profile on the internet, it is a vital tool for communication, marketing, research, amongst others. Facebook is capable of functioning as an essential a VLE because it enables both synchronous and asynchronous communications between users. The use of Facebook as a VLE in the academic library will prove to be very effective for both librarians and library users by providing a means of seamless flow of interactions. More so, Facebook enables multimedia sharing and live group chats, which are capable of further facilitating the process of information delivery by academic libraries.

WhatsApp

WhatsApp is a rapid evolving web 2.0 tool. It allows connection based on cell phone numbers. WhatsApp enables a fast and continuous rate of communication between users. WhatsApp is capable of being an expedient VLE based on its prolific features such as the ability to send and receive multimedia files such as: images, music, video clips and documents. WhatsApp also has the capability of creating group for users, to share and discuss issues. This is the feature that is most suitable for academic libraries, apparently, academic libraries can create their own WhatsApp groups and add their users. Thus, engaging students in the process of teaching and learning. Hence, multimedia files are capable of being sent and received in order to expedite the process of learning. The integration of WhatsApp in the academic library would prove advantageous for academic libraries. Thus, paving a way for academic libraries to thrive in the ever growing technology-oriented society.

Academia.edu

Academia.edu is a web 2.0 tool developed specifically for students, academics and researcher, it provides a new platform to share research on a global scale. The intent for this social media is to disseminate research for data mining. Academia.edu is stated to be the appropriate VLE because it is solely based on the sharing of knowledge between users. Academia.edu would prove to be extensively useful for librarians and students, in terms of multitudinous access to information and academic contents. Additionally, Academia.edu gives space for students to establish themselves in their various fields of interest. This specific web 2.0 tool can be used by academic libraries to closely monitor the academics development of students. The use of Academia.edu in academic libraries would further anticipate the future of academic libraries in terms of augmenting their services to library users.

CONCLUSION

The development in terms of information communication technologies (ICTs) in the 21st century has drastically remodified how information is being acquired, stored and accessed. The academic library has continuously been an advocate of technological change in the 21st century, reason being that, the academic library serves as a repository of knowledge for its parent institution and it is required of the academic library to find the most efficient means of delivering information to its users (most especially students). The emergence of VLE has massively impacted on how information is be shared and received in the course of learning, such that learners are enabled to learning from remote locations at any given time. This being the case, the academic library is required to exploit the opportunities brought about by the emergence of VLE so as to maintain its position in the contemporary society as the hub of information generation, preservation, provision and dissemination.

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Richard Oluwadolapo Awoyemi is a graduate assistant in the Adeyemi Federal College of Education, Nigeria. His research interests are in evolution and integration of ICT in education and most particularly in language use in the 21st century.